

A new species of *Ethmia* Hübner, 1819 from the Greek island of Rhodes (Ethmiidae)

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Summary. Description of a new species from Greece (Rhodes), *Ethmia mariannae* sp. n., is given, in comparison with its most closely related species, *Ethmia iranella* Zerny, 1940, and *Ethmia treitschkeella* (Staudinger, 1879).

Key words. *Ethmia*, new species, taxonomy, Rhodes, Europe.

Introduction

The Ethmiidae is a comparatively small family of rather conspicuous moths, with about 300 described species in 3–5 genera, which are distributed in all major continents. They form a basal clade of the Gelechioidea next to the Stenomatidae, but in spite of being rather easily recognizable they are only supported by few synapomorphies (Hodges 1999). The group is treated either as a subfamily of the Elachistidae (Minet 1990; Hodges 1999) or given family status (Sattler 1967; Riedl 1996). Here we follow the latter opinion.

Ethmiids are among the best known gelechioid moths. The Palaearctic fauna was monographed by Sattler (1967) who recognized 72 species. He placed all species in the genus *Ethmia* Hübner, 1819, which he divided into 23 species groups. Riedl (1996) listed 27 species from Europe.

The European ethmiid fauna has subsequently been studied by a number of authors. Taxonomic or faunistic studies of the Ethmiidae were published for the European part of the former Soviet Union (Zagulajev 1990), Poland (Buszko 1978), northern Europe (Palm 1989), central Europe (Hannemann 1997), and Great Britain and Ireland (Sattler 2002). Other additions to the knowledge of the European ethmiids are either data on their bionomics (e.g., Szeőke & Dulinafka 1989; Prins *et al.* 1991; Kun 2001), regional faunistic works (e.g., Burmann 1980; Popescu-Gorj 1984; Szyska 1997) or checklists of certain regions and/or countries.

The Ethmiidae of Europe can be considered as well known even though several species, and especially their biology, are still imperfectly known. The latest valid species of *Ethmia* (apart from subspecies and replacement names) described from Europe is *E. rothschildi* (Rebel, 1912).

During a short holiday trip to the island of Rhodes, Michael Fibiger collected with automatic light traps in two localities a series of males of a distinct, undescribed *Ethmia* species, which is described below.

Abbreviations

BMNH – Natural History Museum, London, U. K., HNHM – Hungarian Natural History Museum, Budapest, Hungary, SUTT – Coll. R. Sutter, Bitterfeld, Germany, ZMUC – Zoological Museum, University of Copenhagen, Denmark, ZSM – Zoologische Staatssammlung, München, Germany.

Ethmia mariannae sp. n.

Material. Holotype ♂ 'GR, Rhodos, Kolombia, 40 m, 4.–5.VII.2000, leg. M. Fibiger; Gen. slide No. 3142, *Ethmia*, H. Hendriksen' (ZMUC). Paratypes: 9 ♂ with the same data as the holotype (ZMUC, HNHM), Gen. slide 403, A. Kun (HNHM); ♂, same data as the holotype, except 5 km S. Rhodos, 4.–8.vii.2000 (ZMUC). Material excluded from the type series: 3 ♂, Greece, Karpathos Island, Lefkos, 30 m, 17., 19. & 22.v.1997 (Sutter), Gen. slide 5367, 5485 (SUTT, BMNH).

Adult (males only) (Fig. 1). Wingspan 14–15 mm. Antenna filiform, scape and basal segments with white scales; flagellum grey; maxillary palpus small, with grey scales. Labial palpus with black ring on second segment, terminal segment grey, apically pointed; base of proboscis with bright grey scales; frons and vertex similarly grey, with black scales along junction of head and prothorax. Thorax bright grey with two pairs of black dots; tegulae greyish, with a pair of black (anterior) spots. Costal half of forewing suffused with darker grey; basal half overlaid with five sharply defined black spots, two of them placed along borderline between darker costal and paler inner half of wing, dividing this line into three rather equal portions; a further smaller spot situated close to tornal angle, just below distal dark spot of borderline; last two spots often elongate, patchy or streak-like, placed along basal half of axillary vein; black marginal dots present, tiny; cilia bright grey. Hindwing grey, with grey cilia; costal brushes absent. Forelegs and midlegs darker grey, hindlegs covered with yellowish scales. Abdomen greyish yellow, with blackish scales on ventral surface.

Variation. Specimens from Karpathos island differ in being slightly larger (wing-span 17–19 mm), by having the costal part of the forewings more brownish grey and by the more yellow posterior part of the abdomen.

Male genitalia (Figs. 4, 4a). Uncus bifid, apically pointed, with deep, narrow medial incision. Posterior part of gnathos well developed, dentate, anterior part slightly bilobate, finely dentate. Labis wide-based, triangular; anellus sclerotised. Valva with bristles; costa broad, with rounded apical part. Cucullus broad, curved ventrad, rather hooked; covered with scattered, fine bristles. Sacculus large, rather triangular,



Fig. 1. *Ethmia mariannae* sp. n. Paratype (ZMUC). Fig. 2. *Ethmia iranella* Zerny, 1940 (HNHM).

sclerotized, with pointed process at postero-lateral edge; characteristic sclerotised basal fold. Vinculum V-shaped. Aedeagus gun-shaped; cornutus long, pointed.

F e m a l e . Unknown.

D i s t r i b u t i o n . Only known from the Greek islands of Rhodes and Karpathos.

B i o n o m i c s . Early stages unknown. The type series (apart from one specimen) was collected with automatic light traps near the town Kolombia, behind a petrol station. The habitat is a hot, xerothermic rocky area, with some herbaceous plants. Another specimen was found near Rhodes city, in a rather different vegetation type (M. Fibiger, pers. comm.). The type series was collected in early July during a period with high temperatures.

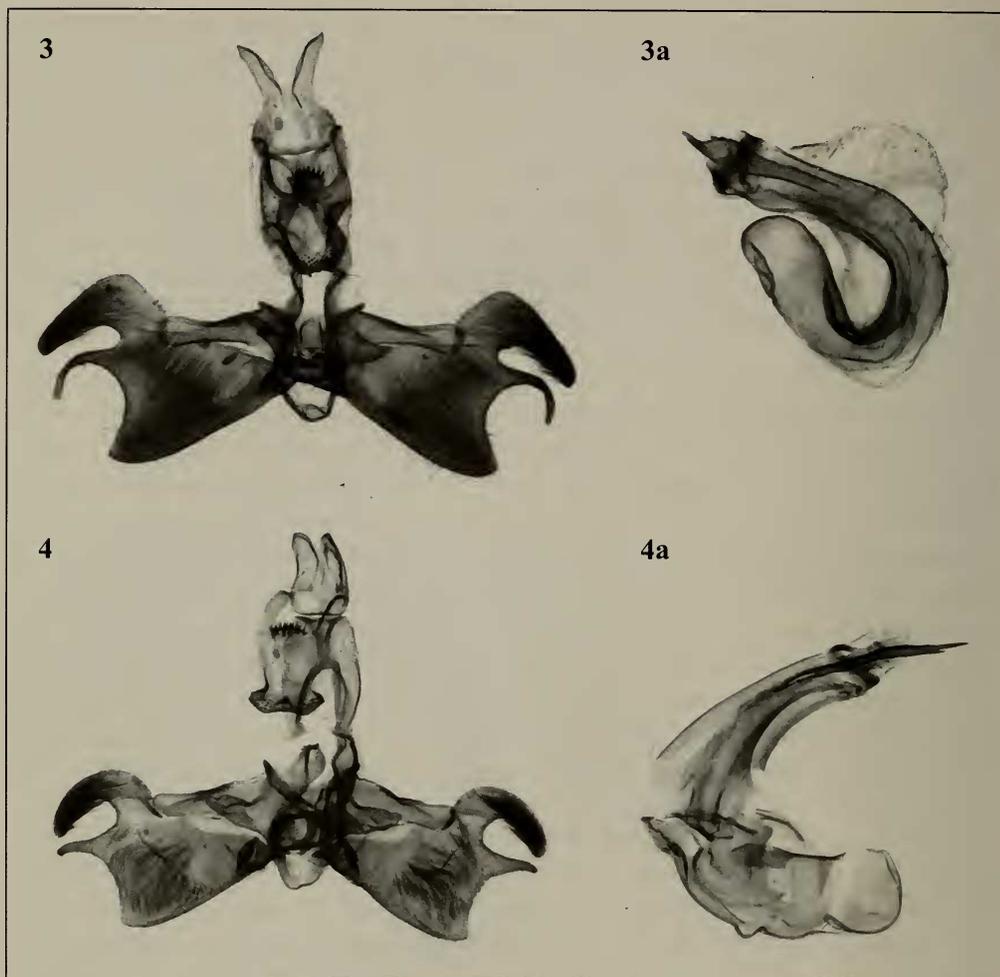
E t y m o l o g y . – The new species is dedicated to Mariann Fibiger for supporting the field work of her husband Michael Fibiger during their holiday in Rhodes.

Discussion

E. mariannae belongs to the *Ethmia bipunctella* species-group (sensu Sattler 1967). This group is characterised by a well developed mouth structure, a long proboscis, a four-segmented maxillary palpus, dark spots of the thoracic pattern arranged in a similar way, last segments of the abdomen and hindlegs yellowish, costal brushes absent, uncus divided in some species, posterior and anterior parts of gnathos dentate, labis developed, cucullus curved, sacculus with pointed distal process, aedeagus with one pointed cornutus, antrum with a thorn, a long helical ductus bursae, corpus bursae with appendix and signum trilobate dentate.

The closest relatives of *E. mariannae* are *E. iranella* Zerny, 1940 (Figs. 2, 3, 3a) and *E. treitschkeella* (Staudinger, 1879). The male genitalia of these three species display the same *ground plan*. The external appearance of *E. mariannae* is, however, conspicuously different from those of the two allied species, and it is also much smaller, with a wingspan of 14–15 mm, while those of the other members of the *bipunctella*-group measure between 18 and 28 mm (Sattler 1967; Kun, unpublished). The forewing pattern of *E. mariannae* is characterized by the smaller black dots in the forewing and the uniformly greyish costal part, while the costal half of the forewing is black in *E. iranella* and *E. bipunctella*. The black spot on the border of the head and the prothorax is only present in *E. mariannae* and *E. iranella*. The male genitalia of *E. mariannae* (Figs. 4, 4a) differ mainly from those of *E. iranella* by the differently shaped, broader, more curved cucullus, the shorter and pointed distal sacculus process, the shape of the sacculus, and the long, more pointed cornutus.

We have of course considered the possibility that *E. mariannae* may represent a subspecies of *E. iranella*. We have therefore examined material of the latter, including their male genitalia, from throughout its distribution range, apart from Spain, from where no specimens were available. From this survey we conclude that *E. iranella* is a species with nearly no variation in wing pattern and genitalia. Despite of its huge distribution area it shows no tendency to subspecies formation. *E. mariannae* is clearly separated from *E. iranella* in the above mentioned characters, and we thus conclude that it represents a species distinct from *E. iranella*.



Figs. 3–4. Male genitalia. Figs. 3, 3a. *Ethmia iranella* Zerny, 1940, Gen. prep. Kun No. 206 (HNHM). Figs 4, 4a. *Ethmia mariannae* sp. n. Paratype, Gen. prep. Kun No. 403 (HNHM).

Material examined of *E. iranella* (only dissected males). Greece: ♂, Korinthos 22.vi.1985 (K. Szeöke), Gen. slide 296, A. Kun (HNHM); Hungary: ♂, Ágasegyháza, homokbuckás, 1.viii.1956 (Gozmány), Gen. slide 292, A. Kun (HNHM); Iran: ♂, Elburz Mts., Tacht i Suleiman, Hecarcál valley, 2800–3200 m, 3.–7.vii.1936 (Osthelder), ZSM Gen. slide. No. 125 (ZSM); ♂, Prov. Teheran, Elburz Mts. 10 km S of Semsak, Deezin, 2000 m, 21.vii.2000 (Benedek), Gen. slide 293, A. Kun (HNHM); Italy: ♂, Taranto, Lido Silvana, 23.viii.1968 (Hartig), BM Gen. slide 30106 (BMNH); Turkey: 2♂, Prov. Ankara, Lake Tuz Gölü, 8 km N of Sereflikochisar, 1100 m, 33°16'E, 39°00'N, 24.iv. 1989 (Fábián, Ronkay & Ronkay), Gen. slide. 206 (fig 3.), 294, A. Kun (HNHM); ♂, Prov. Kayseri, Avanos, 920 m, 34°55'E, 38°41'N, 19.v.2001. (Fábián & Víg), Gen. slide 295, A. Kun (HNHM).

The three male specimens from Karpathos Isl. are excluded from the type series because of the differences in size and wing pattern described above. Even though their genitalia fit to those of *E. mariannae* further studies, when more material of both sexes and host plant data become available, may show them to represent a further taxon, probably on subspecific level.

Hostplants of Ethmiidae are in most cases members of the Boraginaceae. The early stages of the taxa of the *E. bipunctella* species-group and their bionomics are still poorly known, apart from *E. bipunctella* itself, which has been studied in some detail (Szeöke & Dulinafka 1989; Prins *et al.* 1991). The immature stages and the host plants of the other members of the species-group are still undiscovered. *E. bipunctella*, which, according to literature data, feeds on various Boraginaceae species, e.g. *Onosma arenaria*, *Anchusa officinalis*, *Echium vulgare*, *E. calycinum*, *Cynoglossum officinale*, *Symphytum* sp. and *Alkanna tinctoria*, has also been recorded from Rhodes. *E. iranella*, the most closely related species of *E. mariannae*, is distributed in Spain, Hungary, Romania, Greece, European part of Russia, Turkey, Syria, Iran Transcaucasus and Turkmenia (Sattler 1967; Zagulajev 1990; Neumann 2000). Zagulajev (1990) also records *iranella* from northwest Asia, but this requires confirmation.

Field observations of adult *Ethmia* suggest that they are most abundant close to their host plants and rarely fly far from these. However, it is still surprising that *E. mariannae* has not been discovered before on the island of Rhodes especially during the field work of László Gozmány and the late Joseph Klimesch (Gozmány, in press). One can only speculate about the reasons for that, but one reason could be that the automatic light traps used by Michael Fibiger worked throughout the night and hence also attracted moths flying only late in the night or towards the early morning.

The type series of *E. mariannae* is in good condition except that the antennae of most specimens are broken. Due to the high temperature the numerous moths collected in the light traps quickly became dry and their antennae broken by subsequent moths moving around after being caught in the trap (Michael Fibiger, pers. comm.).

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References

- Buszko, J. 1978. Ethmiidae. – Klucze Oznac. Owad. Pol. 27 (36): 1–21. Warszawa.
- Burmans, K. 1980. Beiträge zur Microlepidopterenfauna Tirols. 2. Ethmiidae (Lepidoptera). – Nachrbl. Bayer. Ent. 29: 25–29.
- Gozmány, L., in press. The Lepidoptera of Greece. – Hellenic Zoological Society, Athens.
- Hannemann, H. J. 1997. Kleinschmetterlinge oder Microlepidoptera 5: Oecophoridae, Chimabachidae, Carcinidae, Ethmiidae, Stathmopodidae. – Tierwelt Dtl. 70: 1–165.
- Hodges, R. W. 1999. The Gelechioidea. In: N. P. Kristensen (ed.): Lepidoptera, moths and butterflies. Volume 1: Evolution, systematics, and biogeography. – Handbuch der Zoologie 4 (35). – Walter de Gruyter, Berlin, New York. – Pp. 131–158.
- Kun, A. 2001. Data to the distribution and bionomics of *Ethmia dodecea* (Lepidoptera: Oecophoridae) in Hungary. – Folia ent. Hung. 62: 383–384. [Hung.]
- Minet, J. 1990. Remaniement partiel de la classification des Gelechioidea, essentiellement en fonction de caractères pré-imaginaux. – Alexanor 16: 239–255.

- Neumann, H. 2000. *Ethmia iranella* Zerny, 1940 (Ethmiidae) und *Aterpia circumfluxana* Christoph, 1881 (Tortricidae), zwei fuer Rumaenien neue Mikrolepidopterenarten. – Entomol. Romanica 4 (1999): 69–72.
- Palm, E. 1989. Nordeuropas Prydvinger (Lepidoptera: Oecophoridae). – Danmarks Dyreliv 4: 1–247 (incl. 8 pls.). Fauna Bøger, København.
- Popescu-Gorj, A. 1984. *Ethmia lugubris* (Staudinger) (Lepidoptera, Ethmiidae), espèce nouvelle pour la faune de Roumanie. – Trav. Mus. hist. nat. Gr. Antipa 25: 239–240.
- Prins, A. H., Laan, R. M., Verboom, J. & Verboom, B. 1991. Food plant quality of *Cynoglossum officinale* and herbivory by *Ethmia bipunctella* (Lepidoptera, Ethmiidae). – Neth. J. Zool. 41: 184–193.
- Riedl, T. 1996. Ethmiidae. In: O. Karsholt & J. Razowski (eds.): The Lepidoptera of Europe. A distributional checklist. – Apollo Books, Stenstrup. – Pp. 63–64.
- Sattler, K. 1967. Ethmiidae. In: H. G. Amsel, F. Gregor & H. Reisser (eds.): Microlepidoptera Palaearctica 2 (1): i–xi, 1–185; 2 (2): pls. 1–106. Wien.
- Sattler, K. 2002. Ethmiidae. In: A. M. Emmet & J. R. Langmaid: Oecophoridae – Scythrididae (excluding Gelechiidae). The Moths and Butterflies of Great Britain and Ireland 4 (1). – Harley Books, Colchester, Essex. – Pp. 178–187, pl. 5.
- Szeöke, K. & Dulinafka, G. 1989. Damage of *Ethmia bipunctella* F. (Lep. Ethmiidae) in *Alkanna tinctoria* plants. – Növényvedelem 25: 142. [Hung.]
- Szyska, P. 1997. *Ethmia fumidella* Wocke, ny sjælden dansk småsommerfugl. – Lepidoptera 7: 112–113.
- Zagulajev, A. K., 1990. Family Ethmiidae. In: G. S. Medvedev (ed.): Keys to the Insects of the European part of the USSR 4, Lepidoptera, part 2. – E. J. Brill, Leiden, New York, København, Köln. – Pp. 853–871.